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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,327	02/06/2004	Ankan Pramanick	333772000900	4514

20872 7590 01/31/2007

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EXAMINER	
KUNDU, SUJOY K	
ART UNIT	**PAPER NUMBER**
2863	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
2 MONTHS	01/31/2007	PAPER

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/772,327
Filing Date: February 06, 2004
Appellant(s): PRAMANICK ET AL.

Thomas Chan
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed September 25, 2006 appealing from the Office action mailed June 28, 2006.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal in the brief is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 6,028,439	Arkin et al.	02-2000
US 2002/0183955 a1	Adler	12-2002
US 2003/0167277 a1	Hejisberg et al.	09-2003
US 6,782,336	Shah	08-2004

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Arkin et al. (6,028,439).

With regards to claim 1, Arkin teaches a distributed operating system for a semiconductor test system for testing at least one device under test (DUT), the operating system comprising:

A host operating system (Fig. 1, 16) for enabling control of at least one site controller by a system controller, wherein the at least one site controller does not share a common clock and (Column 5, Lines 26-30 and Column 7, Lines 31-42);

At least one local operating system (Fig. 2, 30) associated with each site controller (Fig. 2, 38A) for enabling control of at least one test module (Fig. 1, 14) by an associated site controller (Column 7, Lines 31-42),

Wherein the associated site controller controls at least one test module interactively with the associated site controller in a plug-and-play manner (Column 5, Line 59 – Column 6, Line 12), and

Wherein at least on test module (Fig. 1, 14) performs testing on a corresponding DUT (Column 7, Lines 31-42).

With regards to claim 2, Arkin teaches a distributed operating system wherein the host operating system synchronizes operation of the at least one site controller (column 6, lines 31-38).

With regards to claim 3, Arkin teaches a distributed operating system wherein the host operating system arbitrates communication between the system controller and the at least one site controller (Column 7, Lines 31-42).

With regards to claim 4 &5, Arkin teaches a distributed operating system wherein the host operating system monitors operation of the at least one test module associated with a site controller (Column 7, Lines 43-61).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6-8, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arkin (6,028,439) as in view of Adler (US 2002/0183955 A1).

With regards to claims 6-8, 24 Arkin teaches all the limitation above, however Arkin does not teach a distributed operating system further comprising a test module interface for defining test module functions for interfacing a site controller to a first test module, wherein the test module interface is extensible to interface the site controller to

a second test module, the unextended test module interface being insufficient for interfacing the site controller to the second test module.

However Adler, teaches a distributed operating system further comprising a test module interface (Fig.1, 44) for defining test module functions for interfacing a site controller (Fig. 1 45, "driver module") to a first test module, wherein the test module interface is extensible to interface the site controller (Fig.1 34, 36, Page 3, Paragraph 29) to a second test module, the unextended test module interface being insufficient for interfacing the site controller to the second test module (Page 3, Paragraph 31).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a test module interface for defining test module functions for interfacing a site controller to a first test module, wherein the test module interface is extensible to interface the site controller to a second test module, the unextended test module interface being insufficient for interfacing the site controller to the second test module as taught by Adler into Arkin for the purpose of providing a practical limit to the number of tester boards that the host can reprogram within a reasonable time between tests (Arkin, Column 2, Lines 53-55).

Claims 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arkin and Adler as applied to claims 6-8 above, and further in view of Hejlsberg et al.(US 2003/0167277 A1).

Regarding claims 9-14, 19 Arkin, teaches all the limitations as discussed above, however Arkin as modified does not teach a distributed operating system wherein the at least one host framework class is developed in a standard computer language to enable

a user to develop application specific classes for controlling the at least one site controller. Hejlsberg discloses a distributed operating system wherein the at least one host framework (Paragraph 32, 132) class is developed in a standard computer language (Paragraph 26, 140, " C or C++") to enable a user to develop application specific classes for controlling the at least one site controller (Paragraph 26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a distributed operating system wherein the at least one host framework class is developed in a standard computer language to enable a user to develop application specific classes for controlling the at least one site controller as taught by Hejlsberg into Arkin and Adler for the purpose of maintainability.

With regards to claims 15, 17, and 18, Arkin teaches a distributed operating system wherein the number of modules controlled by the site controller is scalable (Column 7,Lines 24-29, "high-speed parallel bus").

With regards to claim 16, Arkin teaches a distributed operating system wherein associated with a corresponding site controller enables the type of test modules controlled by the site controller to be reconfigured (Column 7, Lines 13-23).

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arkin, Adler, and Hejlsberg as applied to claims 9-14 and 19 above, and further in view of Shah (6,782,336).

Regarding claim 20, Arkin teaches all the limitations as discussed above, however Arkin as modified does not teach a distributed operating system further comprising of an emulator for simulating the usage of a candidate test module with the

test system to verify the candidate module as compatible with the test system. Shah discloses a distributed operating system further comprising of an emulator (Fig. 2, 46) for simulating the usage of a candidate test module with the test system to verify the candidate module as compatible with the test system (Column 4, Lines 44-51).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a distributed operating system further comprising of an emulator for simulating the usage of a candidate test module with the test system to verify the candidate module as compatible with the test system as taught by Shah into Arkin, Adler and Hejlsberg for the purpose of improving the debugging process of the system.

Regarding claim 21, Arkin teaches a distributed operating system wherein a first set of modules at a first test site is configured differently than a second set of modules at a second test site (Background of the Invention, Column 1, Lines 46, 53).

Regarding claim 22, Arkin teaches a distributed operating system wherein a first test site having a first configuration to test a first DUT, and a second test site having a second configuration to test a second DUT, wherein the first and second test sites are reconfigurable to form together a third test site to instead test a third DUT (Column 3, Lines 34-42).

Regarding claim 23, Arkin teaches a distributed operating system wherein a first module at a first test site can access a second module at a second test site (Column 3, Lines 13-34).

(10) Response to Arguments

With respect to Claims 1-5 Appellant argues that the Arkin reference fails to disclose the system structure required by Claim 1. Appellant respectfully submit that the Arkin reference does not disclose the structure of System Controller – Site Controller(s) – Test Module(s) – DUT(s) of the present invention, which is distinguished from the structure of System Controller – Tester Module(s) – DUT(s) disclosed by the Arkin reference. Appellant would like examiner to address the following: 1) which element in the Arkin reference discloses the system controller of claim 1; 2) which element in the Arkin reference discloses the site controller of claim 1; 3) which element in the Arkin reference discloses the test module of claim 1; and 4) which element in the Arkin reference discloses the DUT of claim 1.

Examiner's position is as follows: 1) The Arkin reference discloses a system controller of claim 1, as shown in Figure 2, the micro-controller (30) and further described in Column 7, Lines 31-42; 2) The Arkin reference discloses the site controller of claim 1, as shown in Figure 2, the conventional parallel computer bus (38A) and further described in Column 7, Lines 31-42 as well as Column 8, Lines 14-19; 3) The Arkin reference discloses the test module of claim 1 in Figure 1, the tester module 14 and further described Column 5, Line 59 – Column 6, Line 12; 4) The Arkin reference discloses the DUT of claim 1 as shown in Figure 1, DUT (device under test) (12) and further described in Column 7, Lines 31-42. To clarify the limitations of claim 1, Examiner has provided a marked up copy of Figures 1 and 2.

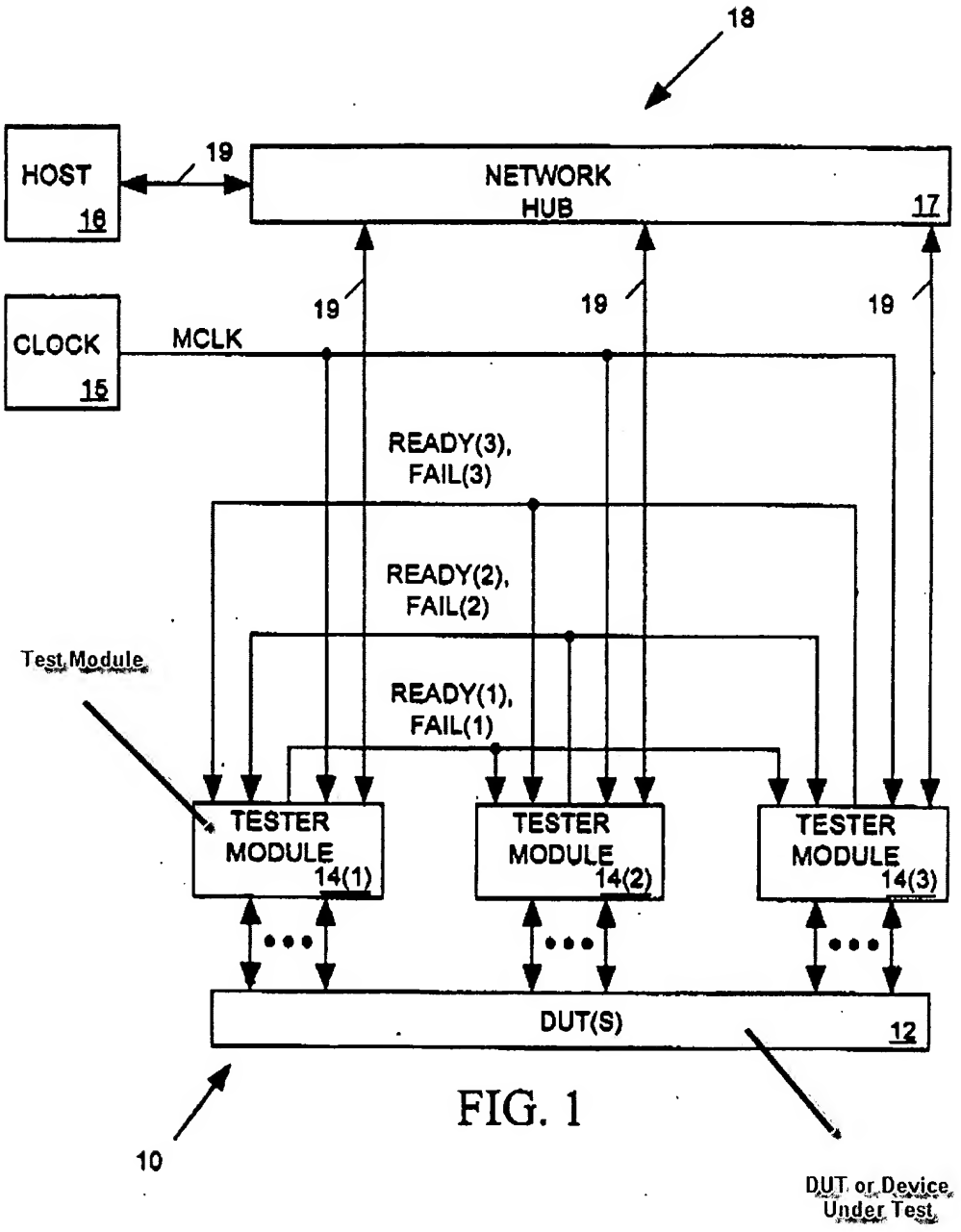
18
HOST
16
19
NETWORK
HUB
17
CLOCK
15
MCLK
19
19
19
READY(3),
FAIL(3)
READY(2),
FAIL(2)
READY(1),
FAIL(1)
Test Module
TESTER
MODULE
14(1)
TESTER
MODULE
14(2)
TESTER
MODULE
14(3)
DUT(S)
12
10
DUT or Device
Under Test

FIG. 1

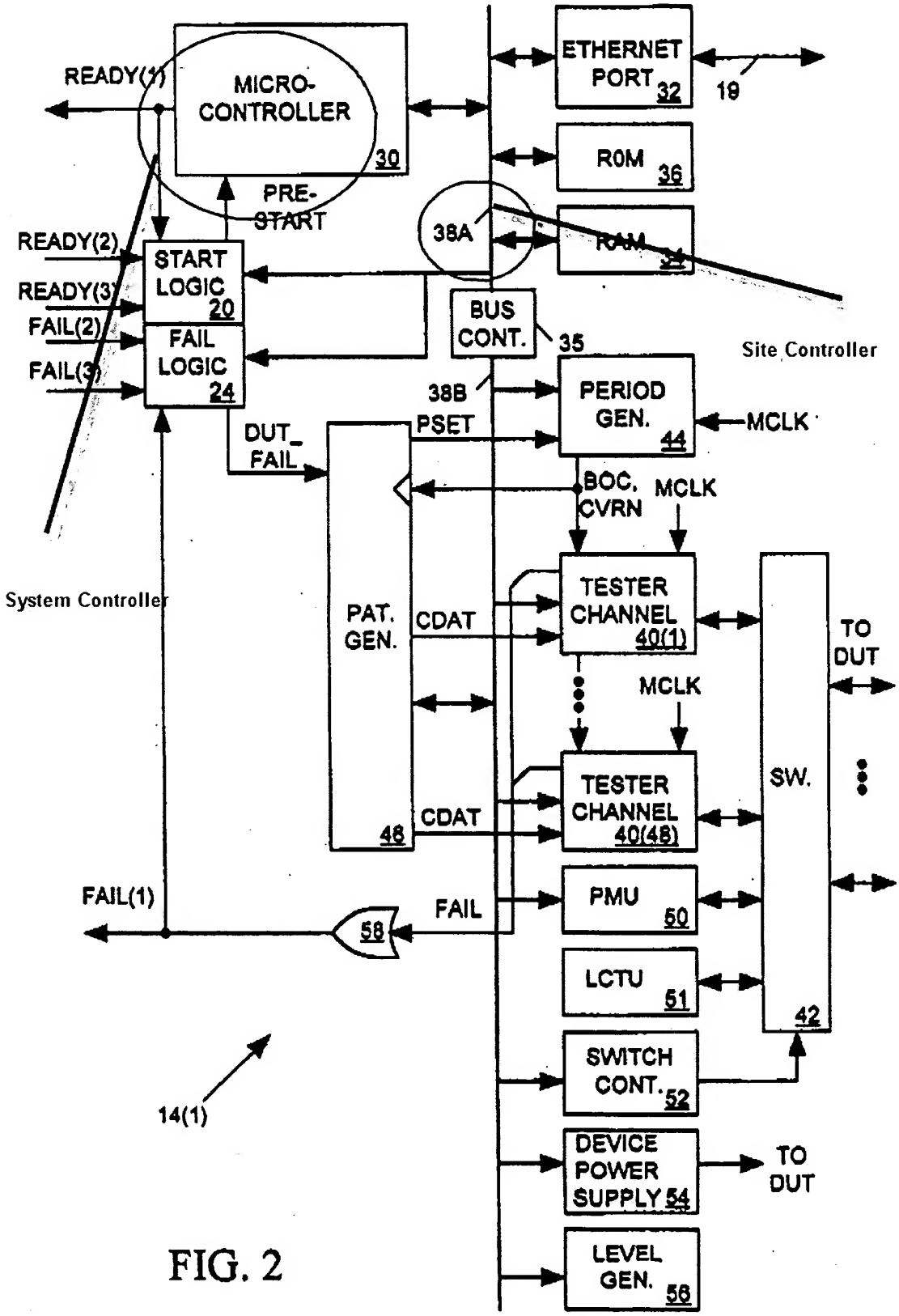
READY(1)
MICRO-CONTROLLER
30
PRE-START
READY(2)
START LOGIC
20
READY(3)
FAIL(2)
FAIL LOGIC
24
FAIL(3)
System Controller
ETHERNET PORT
32
19
ROM
36
38A
RAM
34
BUS CONT.
35
Site Controller
38B
PSET
PERIOD GEN.
44
MCLK
DUT_FAIL
BOC, CVRN
MCLK
TESTER CHANNEL
40(1)
PAT. GEN.
CDAT
TO DUT
MCLK
TESTER CHANNEL
40(48)
SW.
48
CDAT
FAIL(1)
FAIL
PMU
50
58
LCTU
51
42
SWITCH CONT.
52
14(1)
DEVICE POWER SUPPLY
54
TO DUT
LEVEL GEN.
56

FIG. 2

Appellant further argues that the site controller of the Arkin reference cannot control the test module in a plug-and-play manner. Appellant provides an example to better understand the issue at hand. Appellant refers to a computer controlling a digital camera interactively in a plug-and-play manner. A person skilled in the art would understand this statement to mean it is the digital camera that can be attached/detached from the computer. Therefore, the site controller controls a test module interactively in a plug-and-play manner as claimed in the present invention means the test module can be attached/detached from the site controller (and therefore the test system).

Examiner's position is that he respectfully disagrees with appellant. Appellants own specification does not limit one test module interactively with the associated site controller in a plug-and-play manner. According to appellant's specification, "The concept of plug-and-play or replaceable modules is facilitated by use of standard interfaces at both hardware and software levels (Paragraph 13 of Specification). According to the Arkin reference, Arkin uses the method of plug-and-test; where one DUT is tested with a corresponding test module, upon the test completion another DUT is test. Therefore taking the broadest reasonable interpretation of the claim Arkin does teach a one test module interactively with the associated site controller in a plug-and-play manner.

Appellant further argues that claims 6-8 and 24 are patentable over the combination of the Arkin and Adler references. Appellant assert that claims 6-8 and 24

are allowable for at least the reason that they depend from an allowable independent claim.

Appellant's position with respect to those teaching lacking from Arkin were refuted and discussed above. In view of this and the lack of further argument, the examiner maintains this rejection as presented.

Appellant further argues that claims 9-14 and 19 are patentable over the combination of the Arkin, Adler, and Hejlsberg references. Appellant assert that claims 9-14 and 19 are allowable for at least the reason that they depend from an allowable independent claim.

Appellant's position with respect to those teaching lacking from Arkin were refuted and discussed above. In view of this and the lack of further argument, the examiner maintains this rejection as presented.

Appellant's position with respect to those teaching lacking from Arkin were refuted and discussed above. In view of this and the lack of further argument, the examiner maintains this rejection as presented.

Appellant further argues that claims 15-18 and 21-23 are patentable over the Arkin, reference. Appellant assert that claims 15-18 and 21-23 are allowable for at least the reason that they depend from an allowable independent claim.

Appellant's position with respect to those teaching lacking from Arkin were refuted and discussed above. In view of this and the lack of further argument, the examiner maintains this rejection as presented.

Appellant's position with respect to those teaching lacking from Arkin were refuted and discussed above. In view of this and the lack of further argument, the examiner maintains this rejection as presented.

Appellant further argues that claim 20 is patentable over the combination of the Arkin, Adler, Hejlsberg and Shah references. Appellant assert that claim 20 is allowable for at least the reason that they depend from an allowable independent claim.

Appellant's position with respect to those teaching lacking from Arkin were refuted and discussed above. In view of this and the lack of further argument, the examiner maintains this rejection as presented.

(11) Related Proceedings Appendix

There are no related proceedings.

(12) Additional Remarks

Examiner would like to point out that the rejections made on the independent claim are maintained due to the claim language. Specifically, appellant uses the limitations of " at least one site controller," which scope was interpreted by the Examiner to encompass one site controller.

Additionally, the limitation of at least one site controller not sharing a common clock can be interpreted in the fact that limitations such as the host machine inherently contains it's own clock. Thus the host machine's clock and the clock found in the site controller represent two separate clocks in each controller.

Appellant is reminded that during patent examination, the pending claims must be "given the broadest reasonable interpretation consistent with the specification."

Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969).

While the meaning of claims of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim interpretation to be applied during examination. During examination, the claims must be interpreted as broadly as their terms reasonably allowed. This means that the words of the claim must be given their plain meaning unless applicant has provided a clear definition in the specification. In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

(12) Conclusion

For the above reasons, it is believed that the rejection should be sustained.

Respectfully submitted,

Sujoy Kundu

October 30, 2006

John Barlow
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Technology Center 2800

Conferees

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David Blum